

rotating the transport arm about an axis of rotation at a shoulder of the transport arm to rotate the wrist about the axis of rotation; and

moving the transport arm to radially displace the wrist of the transport arm relative to the axis of rotation at the shoulder of the transport arm, wherein the step of moving the transport arm rotates the end effector about the wrist to rotate the substrate about the axis of rotation at the shoulder of the transport arm in concert with rotation of the wrist about the axis of rotation at the shoulder of the transport arm,

wherein the substrate processing apparatus comprises at least three of the substrate holding areas located side by side to each other, the transport arm transporting substrates into and out of each of the three substrate holding areas, and wherein the axis of rotation at the shoulder of the transport arm stays in one location relative to the three substrate holding areas when the transport arm transports substrates into and out of each of the three substrate holding areas.

REMARKS

This is in response to the Final Office Action mailed 5/24/00 (Paper no. 5). Claims 24, and 26 have been amended above. Claims 1-27 remain pending in this application.

Claims 1-5 have been rejected under 35 U.S.C. 102 as being anticipated by Fukasawa et al. (hereafter Fukasawa). The Applicant respectfully disagrees.

Claim 1 calls for moving the transport arm to radially displace the wrist of the arm relative to the shoulder, wherein the step of moving the arm (to radially displace the wrist) rotates the end effector about the wrist to rotate the substrate about the axis of rotation at the shoulder in concert with rotation of the wrist about the axis of rotation at the shoulder.

Fukasawa does not anticipate the combination of features recited in claim 1. As noted in the Applicant's prior Amendment, dated 2/28/00, the arguments of which are repeated, herein, Fukasawa discloses a multi-joint arm member 5 with three convey arms (lower 51, middle 52, upper 53) which are independently pivoted (col. 6, lines 40-43). As shown in Fig. 4, each arm 51, 52, 53 of the multi-joint arm 5 in Fukasawa is pivoted by an independent motor (col. 6, lines 49-51). Thus, in Fukasawa, moving the multi-joint arm 5 to radially displace the wrist (i.e. shaft 53a) relative to the shoulder (i.e. pivot shaft 61) is accomplished by pivoting only the lower convey arm 51 and the middle convey arm 52. In Fukasawa, the upper convey arm 53 need not be pivoted when moving the multi-joint arm 5 for radially displacing the pivot shaft 53a (i.e. the wrist) relative to the pivot shaft 61 (i.e. the shoulder). Rather, the multi-joint arm 5 is moved to radially displace shaft 53a from shaft 61 by pivoting only the lower convey arm 51 and middle convey arm 52 without pivoting upper convey arm 53 about the wrist 53a. Also, pivoting of lower

convey arm 51 and middle convey arm 52 cannot pivot upper convey arm 53 about pivot shaft 53a (i.e. the wrist), because each convey arm is independently pivotable (see Fig. 4). Hence, movement of the Fukasawa multi-joint arm 5 to radially displace the wrist of the arm relative to the shoulder does not rotate the end effector (i.e. the upper convey arm 53) about the wrist (i.e. pivot shaft 53a). In contrast, claim 1 calls for moving the transport arm to radially displace the wrist relative to the shoulder, wherein the step of moving the arm to radially displace the wrist rotates the end effector about the wrist. In Fukasawa, however, movement of the multi-joint arm 5 to radially displace the wrist from the shoulder does not effect rotation of the upper convey arm 53 (i.e. the end effector) about the wrist. The applicant respectfully notes that claim 1 does not call merely for moving the transport arm, but instead for moving the transport arm to radially displace the wrist relative to the shoulder of the arm. This is accomplished in Fukasawa only by pivoting the lower and middle convey arms 51, 52. Furthermore, the examiner is correct, in that claim 1 is not limited to an arm comprising only two sections. Nevertheless, as noted above, in Fukasawa, pivoting the upper convey arm about pivot shaft 53a does not effect movement of the multi-joint arm 5 to radially displace pivot shaft 53a (i.e. the wrist) from shaft 61 (i.e. the shoulder) of the arm. Nor does movement of the multi-joint arm 5 to radially displace shaft 53a from shaft 61 rotate upper convey arm 53 about shaft 53a. Fukasawa does not expressly, nor inherently disclose moving the transport arm to radially displace the wrist relative to the shoulder, wherein the step of moving the arm to radially displace the wrist rotates the end

effector about the wrist as otherwise called for in claim 1.

In any even, Fukasawa does not expressly, nor inherently disclose that the step of moving the arm rotates the end effector about the wrist to rotate the substrate about the axis of rotation at the shoulder in concert with rotation of the wrist about the axis of rotation of the shoulder as also called for in claim 1. In col. 10, lines 37-42, Fukasawa discloses that the multi-joint arm 5 with independently pivotable arms 51, 52, 53, has a high degree of freedom, and a convey path for a wafer W conveyed by the arm which is freely selected within the stroke range of each arm. Nevertheless, having a freely selected convey path is not the same as rotating the end effector about the wrist to rotate the substrate about the shoulder in concert with rotation of the arm about the shoulder as otherwise called for in claim 1. Nowhere does Fukasawa disclose or suggest that the step of moving the arm rotates the end effector about the wrist to rotate the substrate about the axis of rotation of the shoulder in concert with rotation of the wrist about the axis of rotation of the shoulder as called for in claim 1. Claims 1-4 and 27 are patentable over the cited prior art and should be allowed. Similarly claim 5 also reads over the cited prior art and should be allowed.

Claims 8-16 have been rejected under 35 U.S.C. 103 as being unpatentable over Bacchi et al. (hereafter Bacchi) in view

of Ohta et al. (hereafter Ohta). The Applicant respectfully disagrees.

Claim 8 recites that the transport arm transports substrates into and out of three general side by side substrate holding areas.

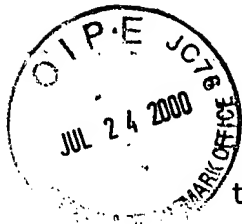
Neither Bacchi, nor Ohta disclose or suggest the features recited in claim 8. In Fig. 6a, Bacchi discloses move profiles of hand 30 for retrieving wafers from two side by side cassettes 168L and 168r. Claim 8 by comparison recites transporting substrates into/out of three side by side cassettes. This is not disclosed or suggested in Bacchi. In Fig. 1, Ohta merely discloses shelf stations 20, and a loading/unloading station 21 which are arranged in a circular array (col. 2, lines 45-46). The circular arrangement of the stations in Ohta is clearly different than side by side substrate holding areas. In the circular arrangement, as disclosed in Ohta, the stations 20, 21 are in front of the adjacent stations and orientated at an angle (not side by side) to the other stations. The stations in the circular arrangement of Ohta are not side by side or alongside each other as called for in claim 8. Combining Bacchi with Ohta as suggested by the Examiner, would merely result in the two side by side stations (as per Bacchi) being arranged in a circular arc as per Ohta such that each station would no longer be side by side but rather one station would be in front and at an angle relative to the other. A person skilled in the art would

not combine the circular arrangement in Ohta with the two side by side stations in Bacchi to provide three side by side holding areas as called for in claim 8. Claims 8-18 are patentable over the cited prior art and should be allowed.

Claim 9 recites that the end effector is slaved to the transport arm so that when the end effector rotates about the wrist, the substrate on the end effector and the wrist rotate about the drive section at substantially equal rate. Neither Bacchi, nor Ohta disclose or suggest the features recited in claim 9.

Claims 24, and 26 have been rewritten in independent form including all the features of Claim 1. In the Office Action, the Examiner has indicated the Claims 24, and 26 would be allowable if rewritten in independent form including all the features of the base Claim. Accordingly, the Applicant respectfully submits the Claims 24, and 26 are now in a form ready for allowance. The Examiner has indicated that Claims 6-7, and 19-23 are allowed.

Claims 1-27 of this Application are now deemed to be in condition ready for allowance. For all of the foregoing reasons, it is respectfully submitted that all of the claims now present are clearly novel and patentable over the prior art of record. Accordingly, favorable reconsideration and allowance is respectfully requested. Should any unresolved issue remain, the Examiner is invited



to call Applicant's Attorney at the telephone number indicated below.

Enclosed is a check in the amount of \$156.00 for the addition of two independent claims. Please charge any fee deficiency arising from the filing of this amendment to Deposit Account No. 16-1350.

Respectfully submitted,

J. W.

7/20/00

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